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9

SECTION

Water Planning and Development

UTAH STATE WATER PLAN - WEBER RIVER BASIN PLAN

Historically, water supplies in the Weber River Basin have been more than adequate to meet local needs. Although this trend is expected to continue into the foreseeable future, short-term water shortages could be experienced due to the lack of adequate infrastructure.

9.1 Introduction

This section of the *Weber River Basin Plan* presents an assessment of current data and projections of future water supply and demand. Some supply and demand data are repeated from other sections to better understand the overall process of projecting water use. Information is offered on most all aspects of water use, including municipal and industrial (M&I), agricultural, outdoor recreation, and a number of environmental uses and demands.

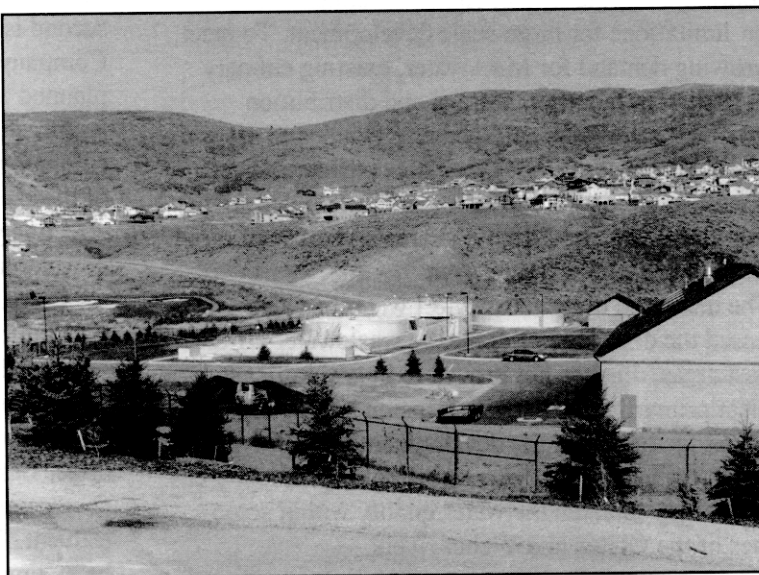
9.2 Background

The Weber River Basin has changed from a collection of small rural farming communities to one of the most urbanized areas of the state. Initially, the area was recognized as a prime location for irrigated agriculture. With the outbreak of World War II and construction of major military bases in the area, the overall demographic makeup began a permanent change. Densely populated urban communities began to replace small family farms and ranches. As a result, water planning and development strategies began to include the construction and operation of large municipal and industrial culinary water systems and facilities.

9.2.1 Past Water Planning and Development

With the influx of immigrants in the mid-1800s and later, the need for raw agricultural produce and irrigation water grew at a substantial rate. By the turn

of the century, the demand for irrigation water outgrew the supply provided by direct-seasonal diversions from local streams. The need for supplemental water storage became a critical factor in supporting the continued growth of irrigated agriculture. To address this need, an era of large water development projects began that featured construction of major reservoirs and water conveyance facilities. From the first reservoir at East Canyon, with an initial storage capacity of 3,800 acre-feet, to the Smith and



Snyderville Basin Sewer Improvement District facility

Morehouse Project, eight major reservoirs are in the basin with a combined 525,900 acre-feet of active water storage capacity.

9.2.2 Current Water Planning and Development

The Weber River Basin is generally considered fully developed in terms of water supply. With the indicated reservoirs in place, over 50 percent of the basin's 979,400 acre-feet of average annual yield can be stored. Once the reservoirs are filled, the basin's water supply is considered adequate to meet local needs for two consecutive years.

The relatively high percentage of storage to annual yield has provided a plentiful supply of water over the years for a broad range of domestic and commercial uses. Planners and managers are now faced with the challenge of providing an adequate water conveyance and treatment infrastructure to meet a growing and changing demand for water. The demand for M&I water is increasing at a rate comparable to population growth. At the same time, the use for agricultural irrigation water is on the decline as residential and commercial developments encroach on farms and ranches.

9.3 Water Resources Problems

Perhaps the largest problem facing local water provider agencies is the lack of infrastructure associated with the growing demand for M&I water. Surface water rights throughout the basin are closed to further appropriation. Groundwater rights are either closed or under limitations for large-scale development. To meet the growing demand for M&I water, existing culinary water treatment facilities, storage and distribution systems will have to be enlarged or expanded to areas of rapid growth; in some cases they are considerable distances from existing infrastructure. Examples are the Snyderville Basin and Park City Area and areas of rapid growth along the East Shore Area.

The increased demand for M&I water has also increased the discharge of domestic wastewater effluent. In most areas, this has not proved to be a significant problem primarily due to the expansion of existing treatment facilities and the development of improved treatment technologies. However, isolated problem areas exist that may threaten the water quality within some reaches of the Ogden and Weber rivers.

9.3.1 Ogden Valley Sewage Disposal and Water Quality at Pineview Reservoir

Ogden Valley currently relies on small lagoons, drainfields and septic tanks to dispose of domestic sewage. The resulting discharge of leachate to underlying groundwater aquifers ultimately migrates to

Pineview Reservoir which is a primary source of culinary and secondary water to a number of local municipalities including the metropolitan Ogden area.

To address a number of water quality issues in Ogden Valley, a *Clean Water Act, Section 314 Clean Lakes Study* was conducted by the Weber Basin Water Quality Council in cooperation with the Division of Water Quality. Although this study determined that existing water quality within Pineview Reservoir was adequate for public culinary use with proper treatment, concern was expressed regarding the impact on future water quality by the continued use of septic tanks and drain fields to dispose of domestic sewage.

The continued use of domestic septic tanks and drain-fields in the Ogden Valley should be the subject of future studies, including groundwater monitoring programs beyond the scope of work initially addressed in the clean lakes study. This study should determine the impact of drain-field effluent discharge on water quality within the reservoir and assess the need for local sewage collection and treatment.

9.3.2 Culinary Water/Wastewater

Treatment Conflict on East Canyon Creek

Two culinary water treatment plants are in the Snyderville Basin and Park City Area. One plant is owned and operated by the Park City Corporation. The second is owned and operated by the Community Water Company in Park West. A third treatment plant is planned by Summit Water Distribution Company. Although the need to develop additional sources of culinary water is immediate for the basin, the operation of these culinary water treatment facilities could effectively reduce the flow of dilution water to downstream wastewater treatment plants.

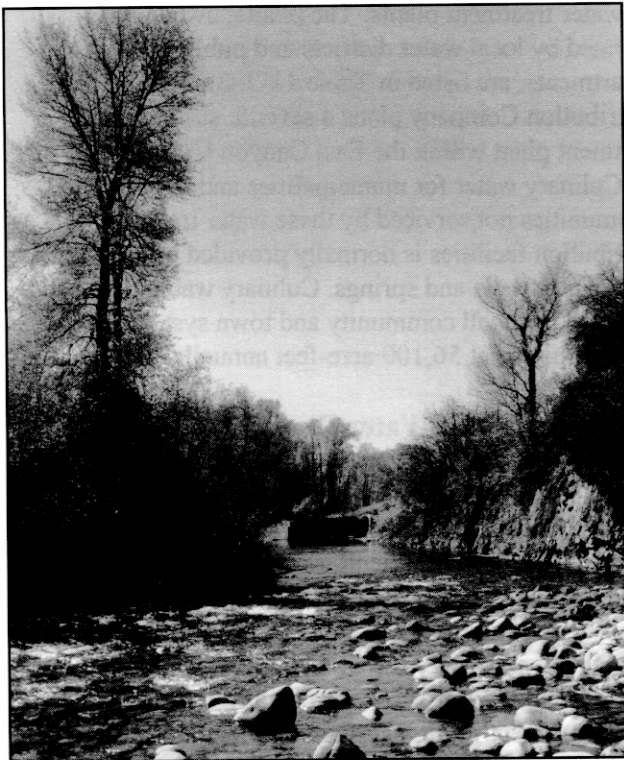
Pressure to increase surface water diversions appears inevitable to meet the growing need for culinary water generated by increased residential and commercial development in the area. As the demand for culinary water grows, surface and groundwater diversions in the upper East Canyon Creek drainage may increase, thereby decreasing the flow of dilution water for wastewater effluent. The solution to the dilution water problem may be an upgrade in treatment at the Snyderville Basin Sewer Improvement District's (SBSID) wastewater treatment plant and/or the implementation of growth restrictions in the overall Snyderville Basin and Park City Area. Growth restriction in the basin is unlikely because Summit County has approved hundreds of building permits.

To treat the increased flow of domestic wastewater and to meet current National Pollution Discharge Elimination System (NPDES) water quality standards, the SBSID may have to incorporate costly tertiary treatment processes at its wastewater plants. Construction costs have been estimated at \$5 million to \$10 million per plant.

9.3.3 East Shore Area of the Great Salt Lake Groundwater Pumping Restrictions

Groundwater diversions have increased throughout the basin. The most marked increases have occurred in the East Shore Area with current annual pumpage of 68,000 acre-feet. As a result, steady declines in local groundwater levels have been measured with the most severe recorded in the North Ogden, South Weber and Layton areas.

To limit, or perhaps manage, the continued trend of groundwater decline, the State Engineer's office, in cooperation with the US Geological Survey, has completed a comprehensive groundwater study including the publication of a groundwater management plan. The plan presents a number of policies and recommendations to local operators of municipal water systems and private individuals to better manage remaining groundwater.



Upper Weber River

Major elements of the plan include:

- Establish an upper limit on the five-year moving average of basin pumpage at 75,000 acre-feet per year with a maximum one-year pumpage of 100,000 acre-feet.
- New wells created by change applications can not impact existing wells with earlier priority dates by increasing established drawdown levels by more than 15 ft.
- All existing wells should be operated in a responsible manner to minimize groundwater interference between adjacent wells and impairment of prior rights.
- All wells with the potential to pump over 100 acre-feet on an annual basis shall be equipped with a flow meter with the annual pumpage reported to the State Engineer's office.
- Water quality data taken at existing wells should be submitted to the State Engineer's office on a voluntary basis.
- Change applications will receive a higher level of review to determine the impact on critical areas of the basin with recent declines in groundwater levels.
- New appropriations for individual domestic wells will be limited to 1.0 acre-foot of annual pumpage in areas not served by public culinary systems. When public water delivery is possible, the well will be sealed and water right terminated.
- Combined annual pumpage will not exceed 6,000 acre-feet within a one-mile radius at any given location within the basin unless reliable and accurate data can be provided to demonstrate that higher withdrawal rates will not adversely effect underlying groundwater levels.

9.3.4 M&I Infrastructure Needs

The growing demand for M&I water has dictated that significant changes need to be made in water treatment, storage and distribution infrastructure. The most pressing needs include the enlargement of existing and the construction of new culinary water treatment plants, transmission systems, culinary wells and secondary water distribution systems.

9.3.5 Capping Abandoned Artesian Wells

Groundwater aquifer conditions are rather complex throughout the basin. A number of areas, primarily in the East Shore Area, have combinations of shallow

unconfined aquifers over the top of substantial confined aquifers. These confined aquifers have been developed with hundreds of artesian wells for most domestic uses including culinary, livestock and irrigation water.

Development of artesian wells in the East Shore Area has been a common practice for over 60 years. With the gradual conversion of agricultural lands to residential and commercial developments, a considerable number of local artesian wells have been abandoned and replaced as a water source by municipal systems owned and operated by established water provider agencies. A considerable number of these wells have not been capped or sealed properly. The flow of water from these wells has often been left unmanaged, and they generally return to the natural surface drainage. As more agricultural land is replaced by urban developments, the unmanaged flows from these wells have proven to be a major problem to developers and municipalities.

A program should be in place to assess the scope of the problem and develop measures to systematically cap and seal abandoned artesian wells. The program could be administered by the Division of Water Rights in cooperation with local city and county agencies involved with flood control or drainage issues.

9.4 Water Use and Projected Demands

The projection of future water demand is based on data and information from a number of sources including 1) diversion records of water provider agencies, 2) various water and land use inventory studies, and 3) the evaluation of consumptive use data.

9.4.1 Municipal and Industrial (M&I) Water Demand

Due to urbanization, M&I water demand will increase at roughly the rate of population growth. The trend in M&I water demand is summarized in Table 9-1.

As a means to forecast water demand, the Wasatch Front Water Demand/Supply Computer Model (WFCM) was developed specifically for the Wasatch Front. The WFCM forecasts future municipal and industrial water needs and evaluates the availability of water supplies along the Wasatch Front including Weber and Davis counties. Table 9-2 summarizes the results of the model evaluation.

As indicated from the table, Davis and Weber counties have sufficient water supplies to meet anticipated needs beyond the planning year of 2020. The following assumptions were used with the WFCM:

- Current developed supplies will continue to be available.
- New secondary systems will convert approximately 92,000 acre-feet of agricultural water to secondary use as agricultural land becomes urbanized.
- New wells constructed by various water suppliers will yield 18,000 acre-feet of groundwater for M&I use.
- At least 25,000 acre-feet of unsold water in Willard Reservoir will be for M&I use.
- Necessary infrastructure improvements will be made in a timely manner.
- Water conservation measures were not included in the initial running of the model. This created a base line from which the impacts of the various conservation measures could be evaluated. The model was then run including various conservation scenarios. The efforts of water conservation are expected to reduce the projected water use by nearly 14 percent (16,200 acre-feet by the year 2020). Water conservation is discussed in Section 17.

The majority of culinary water is provided by groundwater aquifers, but about 35,900 acre-feet per year of surface water is treated to culinary standards by six water treatment plants. The plants, owned and operated by local water districts and public works departments, are listed in Table 11-2. Summit Water Distribution Company plans a seventh surface water treatment plant within the East Canyon Creek drainage.

Culinary water for municipalities and rural communities not serviced by these water treatment and distribution facilities is normally provided by individual community wells and springs. Culinary water supplies provided by small community and town systems have been estimated at 56,100 acre-feet annually.

9.4.2 Secondary Water Demand

The transition of using agricultural irrigation water for urban secondary water needs has started on a relatively large scale. Water provider agencies that have historically provided agricultural irrigation water to basin farms and ranches are actively constructing storage and distribution systems to provide residential and commercial secondary water.

Secondary water systems generally consist of pressurized distribution systems servicing residential developments, municipal parks, and/or large landscaped

Table 9-1
1992 CULINARY (M&I) WATER USE AND PROJECTED DEMAND

Year	Weber	Davis	County Morgan (acre-feet)	Summit	Total Diversion
1992					
Residential	22,000	24,500	1,700	4,900	53,100
Commercial/ Institutional	15,500	16,200	300	1,200	33,200
Industrial	1,600	3,200	800	100	5,700
Total	39,100	43,900	2,800	6,200	92,000
2000					
Residential	20,900	25,600	1,900	6,200	54,600
Commercial/Institutional	16,500	17,300	400	1,500	35,700
Industrial	1,800	3,500	900	100	6,300
Total	39,200	46,400	3,200	7,800	96,600
2010					
Residential	26,400	32,000	2,200	8,700	69,300
Commercial/Institutional	19,500	19,600	400	2,100	41,600
Industrial	2,200	3,800	1,100	100	7,200
Total	48,100	55,400	3,700	10,900	118,100
2020					
Residential	32,400	39,000	2,700	12,000	86,100
Commercial/Institutional	23,000	22,200	500	2,800	48,500
Industrial	2,600	4,100	1,400	200	8,300
Total	58,000	65,300	4,600	15,000	142,900

Table 9-2
PROJECTED CULINARY (M&I) DEMAND AND SUPPLY
DAVIS AND WEBER COUNTIES^a

Year	Demand	Supply (acre-feet)	Surplus (+) Deficit (-)
1992	78,000	160,000	+82,000
2000	80,900	160,000	+79,100
2010	99,700	160,000	+60,100
2020	118,700	160,000	+41,300

Source: Wasatch Front Water Demand/Supply Model, November 1996.
a Does not include Ogden Valley in Weber County.

areas associated with commercial businesses and public buildings. Current and projected levels of secondary water demand for residential, institutional, commercial and industrial (M&I) users are summarized in Table 9-3.

More than 50 percent of residential homes in the basin are presently provided with secondary irrigation water. This percentage is expected to increase in the near future.

9.4.3 Agricultural Water Demand

Although irrigated cropland has steadily decreased over recent years, irrigated agriculture remains the single largest user of water. Based on the most recent 19 years of record (1968 to 1987), the rate of decline in irrigated agricultural land was 1,142 acres per year or 21,700 acres total. An evaluation of urban growth and overall trends in land development indicate the total acreage associated with irrigated agriculture will decline from the current (1995) total of 133,600 acres to 98,500 acres by the year 2020. The indicated loss of 35,100 acres for the 25 year period is expected to account for approximately 80 percent of all land requirements for projected residential, commercial and industrial growth.

The projected decline in demand for agricultural irrigation water is summarized in Table 9-4.

With few exceptions (water amusement parks such as Lagoon, Cherry Hills and Wild Water), water demand for recreation is limited to providing small amounts of culinary water at campgrounds. The Division of Parks and Recreation operates five state parks, and two campgrounds are operated by the Forest Service. Four of the state parks are water-related or located adjacent to reservoirs including Lost Creek, East Canyon, Rockport and Willard Bay. The two campgrounds are located at Pineview Reservoir in the upper Ogden River drainage and Smith and Morehouse Reservoir in the upper Weber River drainage. More discussion on water-related recreation is given in Section 15.

9.4.5 Environmental Water Uses

Water projections associated with state and federal environmental regulations can be substantial. In general, environmental water may be required to maintain wet and open areas, minimum instream flows for fish habitat and waterfowl management areas.

An estimated water supply of 270,000 acre-feet (natural and diverted) is used by the basin's 74,400 acres of wet and open water areas. The direct depletion from wet and open areas has been estimated at 185,300 acre-feet per year. These depletions occur from river and

Table 9-3
1992 SECONDARY (M&I) WATER USE AND PROJECTED DEMAND

Year	Weber	Davis	County Morgan (acre-feet)	Summit	Total Diversion
1992					
Residential, Commercial & Institutional	28,000	28,500	500	2,800	59,800
Industrial	19,900	300	0	a	20,200
Total	47,900	28,800	500	2,800	80,000
2020					
Residential, Commercial & Institutional	76,300	71,100	800	6,800	155,000
Industrial	32,000	1,900	0	a	33,900
Total	108,300	73,000	800	6,800	188,900
a Value less than 50.					

9.4.4 Recreational Water Demand

Actual water demand for the sole purpose of outdoor recreation is small in comparison to other basin uses, but existing storage reservoirs and connecting natural rivers are used extensively for recreational purposes.

stream channels, lakes, ponds, marshes and waterfowl and wildlife areas. It is assumed the current rate of water use by wet and open areas will remain constant.

These numbers do not include the eight major reservoirs shown in Table 5-2. These reservoirs cover

**Table 9-4
IRRIGATED AGRICULTURAL WATER DEMAND**

Year	Weber	Davis	County Morgan (acre-feet)	Summit	Total Diversion
1987	214,900	125,700	41,600	90,500	472,700
1992	202,100	114,100	41,800	88,400	446,400
2000	194,800	102,600	41,400	86,200	425,000
2010	177,800	79,900	41,000	81,800	380,500
2020	158,500	52,400	40,700	76,600	328,200

approximately 22,100 acres which include 9,900 acres for Willard Reservoir. The total reservoir net evaporation is estimated to be 45,000 acre-feet of which 31,000 acre-feet is from Willard Reservoir.

9.4.6 Water Use and Projected Demand Summary

The total water demands and depletions for 1992 to 2050 for the Weber River Basin are shown in Table 9-5. This includes a summary of previously discussed projections for 2020 and additional extrapolations to 2050 for M&I, irrigation, wet/open areas and net reservoir evaporation. The Wasatch Front Water Demand and Supply Model was used to project the demands using population projections presented in Section 4. In general, the demand for municipal and industrial water parallels population growth rates. However, a number of factors can affect actual M&I water demand including the migration of water-intensive industry, the implementation of long-term water conservation programs within residential and commercial developments, changes in lifestyles, and a number of socio-economic considerations.

9.5 Alternatives for Meeting Water Needs

In terms of overall needs, the Weber River Basin is projected to have sufficient water through the year 2020 if agricultural water is converted to M&I use. The significant water needs in the basin center around groundwater management, water quality, changes in traditional water uses, infrastructure and competition between supplier agencies for long-term water service agreements in areas of potentially high water demand.

9.5.1 Water Supply Management

To provide additional M&I water supplies, the Weber Basin Water Conservancy District petitioned Congress in the mid-1980s for a change in storage/use classification at Willard Reservoir. This effort resulted in the reclassification of over 30,000 acre-feet of water initially ear-marked for irrigated agriculture to a general classification for all uses. The reclassified water is expected to be treated to culinary standards or exchanged for better quality water in the upper Weber and Ogden rivers for M&I use.

In addition to increasing the supply of culinary water, a few major water provider agencies are actively converting agricultural irrigation conveyance facilities to residential secondary systems. The Davis and Weber Counties Canal Company and Pine View Water Systems have expanded secondary irrigation systems in both Davis and Weber counties.

9.5.2 Groundwater Management

The acquisition of additional groundwater for increased culinary water demand is difficult. Most of the groundwater pumped is currently being treated and distributed as culinary water. However, groundwater aquifers in highly populated areas have experienced large declines in groundwater levels over recent years.

To address these concerns and as mentioned subsection 9.3.3, the Division of Water Rights, in cooperation with the U.S. Geological Survey, has been involved in various groundwater studies in the more populated areas. A groundwater management plan has been produced for the East Shore Area that delineates a number of actions and discusses policies aimed at

**Table 9-5
WEBER BASIN TOTAL WATER DEMAND AND DEPLETIONS**

Year	1992		2020		2050	
	(acre-feet)					
Use	Diversion	Depletion	Diversion	Depletion	Diversion	Depletion
Municipal and industrial (subtotal)	172,000	72,600	331,800	146,700	575,000	252,960
Culinary	92,000	27,600	142,900	40,700	249,000	69,760
Secondary	80,000	45,000	188,900	106,000	326,000	183,200
Irrigation	446,400	212,000	328,200	164,100	147,000	76,440
Wet/Open Areas	270,000	185,300	270,000	185,300	270,000	185,300
Reservoir Net Evaporation	45,000	45,000	45,000	45,000	45,000	45,000
Basin Total	933,400	514,900	975,000	541,100	1,037,000	559,700

managing the continued decline of groundwater levels in Weber and Davis counties. Groundwater data collection is also being continued in the Snyderville Basin to quantify the available supply in the area. The State Engineer has set a moratorium on new well development in the Snyderville Basin until the affects of additional pumping within existing aquifers can be reasonably determined.

9.5.3 Cloud Seeding

Studies indicate annual accumulations of precipitation can be significantly increased by the seeding of winter clouds. Some estimates indicate that snowpack accumulations and subsequent runoff increases by an average of 10-15 percent as compared with runoff from similar unseeded watersheds.

Local water provider agencies have periodically sponsored cloud seeding projects. The Board of Water Resources typically provides one-third to one-half of the required funding for most cloud seeding projects with the project sponsor funding the remaining portion.

9.5.4 Conservation

As an overall water management objective, water managers must consider the implementation of conservation programs or policies allowing reductions in per capita or per acre water consumption. Once implemented, these water conservation programs and policies should provide standard system operational criteria and policy to assure that reasonable levels of water consumption are maintained throughout a given

service area. Water conservation programs and policies generally encourage, and in some instances require, per acre or per capita consumption levels that are consistent with overall goals or water demand objectives. A comprehensive discussion on water conservation is given in Section 17 of this report.

9.5.5 Bear River Development

The Bear River has long been viewed as an available water resource. An average of over 1.0 million acre-feet flows annually from the river to the Great Salt lake. But based on the river's flow pattern (water is available for development only during the winter and spring months) and poor water quality, it has remained an untapped resource.

During the flooding of the early 1980s, the Division of Water Resources was directed by the legislature to investigate Bear River water storage options that would help control the level of the Great Salt Lake. A joint legislature gubernatorial Bear River task force was created in 1990 to look at water development options on the Bear River. The Bear River Task Force apportioned the state's Bear River water rights to Cache and Box Elder counties, Weber Basin Water Conservancy District and Salt Lake County Water Conservancy District. Counties would get 60,000 acre-feet each and the districts would get 50,000 acre-feet each.

The division was directed by the task force to prepare a plan for delivering the apportioned water right. The *Bear River Pre-Design Report* was published in 1991. It

identified a plan for development that had four major parts. First, development of a water storage reservoir in the upper basin to provide replacement for groundwater withdrawals. Second, a diversion from the Bear River to move water via canal or pipeline to Willard Bay Reservoir. Third, the construction of transmission facilities to move project water from Willard Bay Reservoir south to Davis, Weber, and Salt Lake counties. And fourth, construction of a reservoir on the lower Bear River. The current plan has been modified to constructing a pipeline or canal from the Bear River to Willard Bay Reservoir, a water treatment facility in Weber County, and the necessary conveyance facilities to get finished water to its point of use. The projected cost of that project is approximately \$300 million.

The Bear River Task Force introduced legislation that further defines the state's role in the development of the river. The 1991 Bear River Development Act states the Division of Water Resources shall construct a state project that may include the construction of reservoirs on the Bear River and a pipeline or canal to Willard Bay Reservoir. All facilities constructed to deliver water to potential users from those facilities will be the responsibility of the water purchaser.

The Salt Lake County Water Conservancy District (SLCWCD), in cooperation with the Weber Basin Water Conservancy District (WBWCD), is proposing the construction of a water treatment plant in central Weber County. Currently, SLCWCD is purchasing land for the plant. Also, in cooperation with the WBWCD, the SLCWCD is investigating pipeline alignment alternatives to convey Bear River water from the proposed plant south to Salt Lake County and the east shore area of Davis and Weber counties. This pipeline will deliver needed water to SLCWCD as well as alleviate an infrastructure problem for WBWCD in the east shore area of Davis and Weber counties. These proposed facilities provide the infrastructure to move water south from the Bear River to Salt Lake County, and also the opportunity for various Weber Basin water suppliers to lease surplus water to the SLCWCD.

9.5.6 Snyderville Basin and Park City Area

The Snyderville Basin and Park City Area, a historic mining area, is located in the upper Weber River Basin portion of southwest Summit County approximately 10 miles east of Salt Lake City. The combination of world class ski facilities, lifestyle, mountain atmosphere and close proximity to a major metropolitan city, has made the area a desirable location to live.

In recent years, growth in the area has not been limited to any significant degree by the availability of land or water. But this has changed significantly. Pressure to preserve local wetlands and the overall rapid growth in residential and commercial development has significantly reduced the acreage that can be developed in the area. The resulting increase in demand for M&I water has stressed the capacities of local sources of culinary water to their limits during the summer months.

Over 90 percent of the culinary water in the Snyderville Basin and Park City Area is derived from local groundwater aquifers. In recent years, groundwater levels in some of the most developed areas of the basin have declined and pumping rates have been significantly reduced to maintain adequate hydraulic conditions at individual wells. To stabilize existing groundwater conditions, the State Engineer's office has imposed a moratorium on new "changes" and "exchanges" involving the movement of East Canyon Reservoir water to the Snyderville Basin and Park City Area. Currently, exchange contracts can only be issued for single family building lots with a total annual diversion limitation of one acre-foot. The one acre-foot limitation is expected to remain in force until a comprehensive groundwater study has been completed.

The current culinary water use in the area has been estimated at 5,600 acre-feet annually. With a population growth rate of 4 percent, culinary water demand is expected to reach 14,900 acre-feet by the year 2020. However, the recent award of the 2002 Winter Olympic Games has generated concerns regarding the short term increase in water demand over and above the 4 percent growth rate. It is expected the games will draw tens-of-thousands of spectators to the Snyderville Basin and Park City Area over an approximate one-month period during February of 2002. From now until 2002, water demand in the Snyderville Basin and Park City Area is expected to increase 1-2 percentage points above the long-term average. Nearly all of the spectators and participants to the games will be housed in local hotels and motels or other facilities along the Wasatch Front. However, a number of new motel and condominium complexes are planned for construction in the Snyderville Basin and Park City Area. Also, a proposal for a major development has recently been made to the Summit County Commission which could double the population projected in this area.

Although long-term water demand is a major concern in the area, the issue of providing adequate fire protection also needs to be addressed by local water

planners. Summit Water Distribution Company is currently constructing a number of concrete storage tanks to meet current and projected water requirements.

Until the current groundwater situation is resolved, continued development of the area is dependant on existing surface and groundwater reserves held by each individual water company or district. The reserves are not considered sufficient to meet long-term culinary water demands, so additional culinary water supplies must be acquired or developed. Possible sources include 1) purchase of local surface water rights in East Canyon and Silver creeks, 2) groundwater, 3) reuse of wastewater effluent, 4) importation of storage water from Smith and Morehouse Reservoir, and 5) transfer of water from Davis and Weber Counties Canal Company.

Purchase of Local Surface Water Rights in East Canyon and Silver Creeks - Historically, culinary water supplies have been developed by purchasing existing direct flow or storage water rights and converting them to culinary water supplies through approved “change” or “exchange” applications. As farms and ranches are converted to residential use, these agricultural water rights ought to be converted to culinary water supplies. The conversion occurs by either retiring the surface use in exchange for withdrawing a like quantity of water from an underground well or by treating the surface flows.

Groundwater - Although unlikely, the State Engineer’s groundwater study may locate many new sites for large groundwater wells. The geology of the Snyderville Basin and Park City Area does not lend itself to the types of water wells found in other parts of the state, and large water wells are relatively rare. Many wells start out with production over 1,000 g.p.m. only to be drawn down over time to produce substantially less on a sustained basis.

Re-use of Wastewater Effluent - The re-use of sewage effluent and creation of a secondary water system is one way to extend culinary water supplies. Culinary water which would otherwise be used to irrigate golf courses, lawns and parks could be preserved for culinary uses.

The reuse of wastewater effluent, however, involves a number of water right issues that need to be addressed prior to the application of effluent on public or private land. Water rights associated with wastewater are generally held by the municipality that made the initial diversion for culinary water use. In the event a given municipality treats domestic wastewater flow generated from its own culinary water users, the municipality

generally retains all water rights for treated wastewater and, as a result, is free to reuse it. If domestic wastewater is treated by an independent sanitation or sewer district, the ownership of treated effluent is a more complex issue and must be evaluated on a case by case basis. Nevertheless, reuse of wastewater in all cases is generally considered a wise and prudent use of water resources.

Importation of Smith and Morehouse Reservoir Water - Figure 9-1 shows various options that have been developed to provide up to 6,000 acre-feet of Smith and Morehouse Reservoir storage water to the Snyderville Basin and Park City Area.

These options were evaluated by the Division of Water Resources and other water agencies taking into consideration a number of basic factors such as the constructability within major-existing highway corridors, the possible utilization of existing water conveyance systems to minimize pipeline construction, and the utilization of Jordanelle Reservoir as an equalizing pool for a potential pumping station and treatment plant.

Transfer of Water from Davis and Weber Counties Canal Company - Although the State Engineer has imposed a moratorium on transfers of East Canyon Reservoir water to the Snyderville Basin and Park City Area, the opportunity to develop non-moratorium water involving East Canyon Reservoir may still exist. The Davis and Weber Counties Canal Company has offered to sell between 3,000 and 5,000 acre-feet of new water supplies for distribution to the Snyderville Basin and Park City Area

The available water from East Canyon Reservoir (by exchange) would be pumped from wells within East Canyon downstream of the existing moratorium boundary established by the State Engineer. Summit Water Distribution Company proposes the development of multiple wells and associated pumping facilities that would discharge exchange East Canyon Reservoir water into their existing trunk line for distribution throughout the Snyderville Basin.

9.6 Issues and Recommendations

The Weber River Basin is unique when compared to other river basins in the state in terms of the adequacy of existing water supplies to meet projected demands. Although the basin is experiencing high to moderate growth rates, the basin is projected to have a surplus of water to the planning year of 2020. Isolated areas of water shortages exist due only to the lack of infrastructure and/or water service agreements to meet these demands.

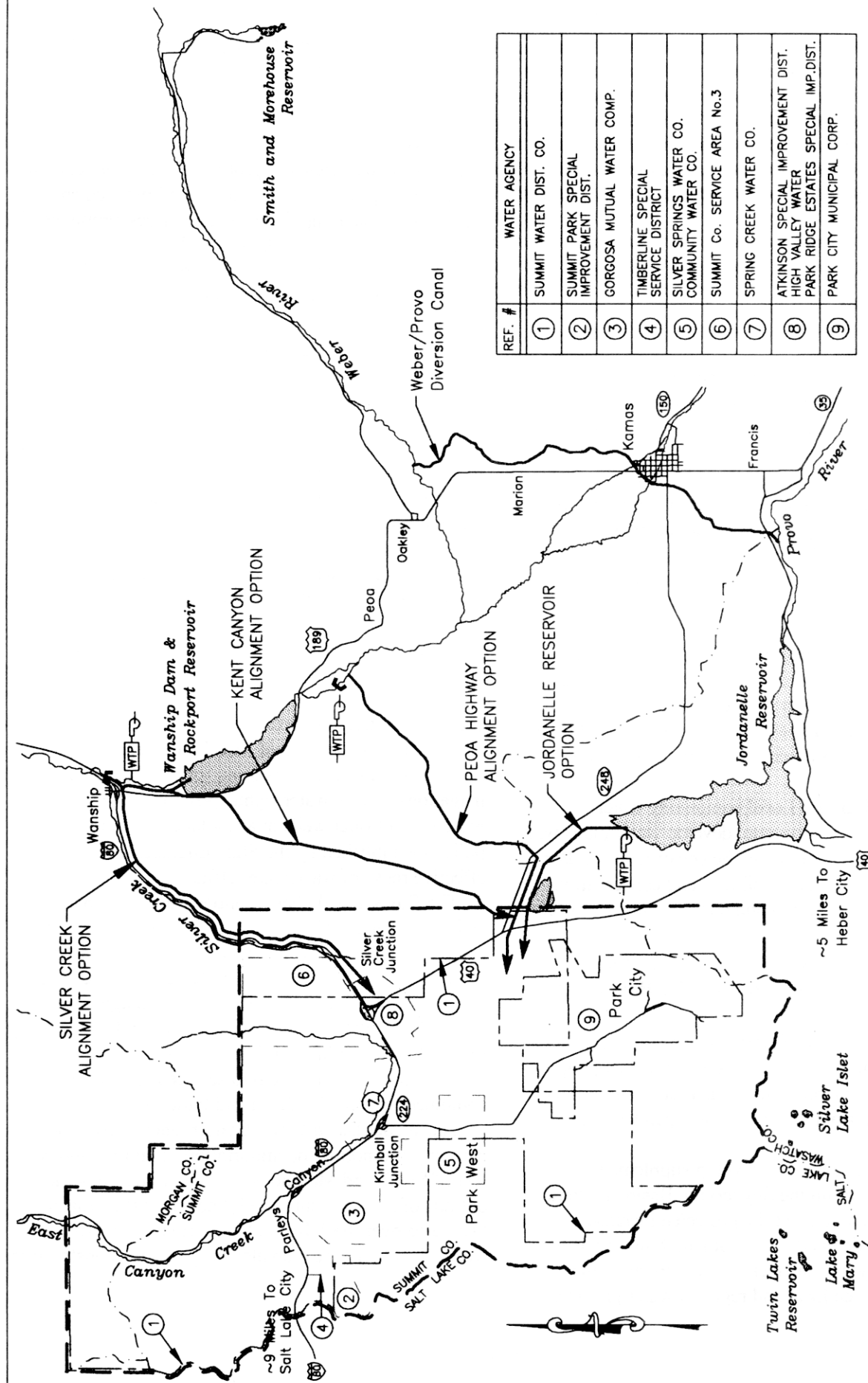


Figure 9-1
SNYDERVILLE BASIN & PARK CITY AREA M&I WATER SUPPLY
SMITH & MOREHOUSE RESERVOIR ALTERNATIVES

The basin is in need of long-range master planning that addresses a number of issues including infrastructure needs in areas of high growth, transfer of water rights from traditional agricultural to M&I uses, consolidation of culinary water distribution facilities in areas serviced by multiple water provider agencies, and the possibility of exporting water to adjacent river basins with projected water shortages.

9.6.1 Long-Term Local Water Planning and Conservation

Issue - Many communities are not adequately planning for growth.

Discussion - Although the Weber Basin has been projected to have adequate water supplies for a 25-year planning period (the exception being the Snyderville Basin), the water resources in the basin are limited, and proven conservation measures should be incorporated into long-range and responsible water planning efforts. Some state and municipal agencies advocate that communities prepare 50-year water plans incorporating various conservation measures when possible.

The major water issue in the Weber River Basin is providing adequate infrastructure and effectively planning for the systematic construction of new water treatment and distribution facilities to meet demands in areas of high growth. In many areas of the basin, substantial projects will have to be constructed within the immediate future to provide water service when it is needed.

Recommendation - Local community water planners should, as a minimum, develop water plans with immediate objectives including the construction and/or replacement of undersized facilities and conservation policies aimed at residential and commercial water users.

9.6.2 Coordinated Water Planning and Development in the Snyderville Basin and Park City Area

Issue - The majority of water provider agencies in the Snyderville Basin and Park City Area are developing water sources and planning the construction of various treatment and distribution systems independently of other agencies.

Discussion - The need to develop supplemental sources of water within the Snyderville Basin and Park City Area is critical to meet the projected increase in local M&I water demand. The problem, however, is not only water supply, but the lack of infrastructure and cooperation between local and regional water provider

agencies to consolidate existing and projected storage distribution, and treatment facilities for the common good of local residents and commercial businesses.

To date, no single entity has stepped up to provide the needed coordination to begin the process of solving the area's water development problems. Yet, it appears the necessary ingredients to provide a well planned and dependable water supply exist. The pieces simply need to be put together in a coordinated fashion.

There is a compelling public interest in resolving the differences of individual agencies in favor of the long-term common interests of local water consumers. Moreover, developing water supplies and constructing related service facilities independent of a coordinated master plan will ultimately result in costly duplications.

The need for additional water supplies within the area has been evaluated by the Division of Water Resources. Estimates of the area's culinary water show that over 90 percent of the area's culinary water is derived from local groundwater sources. In recent years, groundwater levels in some areas have declined and pumping rates have been reduced to maintain adequate hydraulic pumping conditions. Municipal and industrial water demand in the area currently stands at 5,600 acre-feet per year and is projected to increase to 14,900 acre-feet per year by 2020.

Supplemental water can be derived from a number of sources including importation of water currently held in storage at either Smith and Morehouse or East Canyon reservoirs, purchase of existing (primarily agricultural irrigation) surface water rights, possible installation of more groundwater wells in accordance with criteria and policies established by the State Engineer's office, and effective reuse of wastewater effluent.

The Davis and Weber Counties Canal Company estimates that 3,000 to 5,000 acre-feet of new water could be developed and pumped into the area based on its storage rights in East Canyon Reservoir. The canal company is in the process of finalizing an agreement with Summit Water Distribution Company to develop up to 5,000 acre-feet of East Canyon water utilizing their existing distribution system to service most of the combined Snyderville Basin and Park City Area.

The Weber Basin Water Conservancy District is currently promoting the importation of up to 6,000 acre-feet of Smith and Morehouse storage water via various options of high pressure trunk lines from the Wanship Dam area over the Johnson International property to Keetty Junction. The plan also proposes the construction

of related water treatment plants and a number of elevated storage reservoirs.

The implementation of either plan to import water to the area would require a review by impacted state agencies and the overall support of all water provider agencies in the area. Major considerations include consolidating existing water service facilities to provide an efficient, reliable, safe, and cost effective source of water to local residences and businesses; water right conversions (exchanges); overall system management and operation; impacts on water quality due to increased wastewater effluent discharge to existing stream and reservoir systems; and the coordination or evaluation of water development issues with the overall population and economic growth of the area.

Recommendation - Summit County, with the cooperation of all local water provider agencies, should accelerate its planning efforts to prepare a master plan for the Snyderville Basin and Park City Area in order to secure a dependable water supply for their long-term needs. Impacted water provider agencies and water user organizations should conduct a comprehensive study to evaluate various alternatives for importing water to the Snyderville Basin and Park City Area. Appropriate state agencies should assist as needed.

9.6.3 Lease of Weber Basin Surplus Water to Salt Lake Valley Users

Issue - A water surplus exists in the Weber River Basin.

Discussion - The Weber River Basin has been evaluated as having a water surplus well into the 21st Century. As a result, various Weber Basin water suppliers may have the institutional ability and the available surplus water supply to lease water to the Salt Lake County Water Conservancy District until that water is needed in the Weber River Basin.

The proceeds from the lease of water could potentially be used to pay for needed water infrastructure improvements and expansion that will be necessary to accommodate projected growth. The potential lease could also postpone the need to develop and move Bear River water south for several years.

Recommendation - The Weber Basin water suppliers should evaluate the benefits and risks of leasing surplus water to the Salt Lake County Water Conservancy District. ♦